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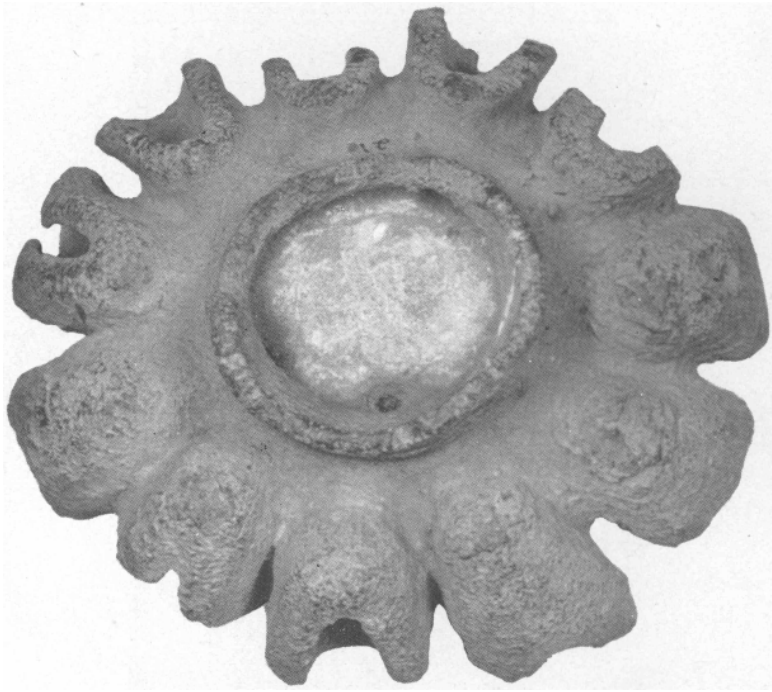

BRACHIOSPONGIA DIGITATA.

A rare Franklin County, Kentucky, Fossil Sponge from the Brannon (Ordovician) limestone. Because of its unusual figure and rarity it is much prized by collectors as a museum piece. Photo by W. R. Jillson, 1927.

THE PALEONTOLOGY OF KENTUCKY

A Symposium outlining systematically, and briefly describing with stratigraphic references the various fossil forms of life indigenous to the rocks of the Commonwealth, arranged and edited

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Dedicated to the

REMARKABLE EARLY SCIENTIFIC IMPULSES

of

M. deLongueil, 1739
Colonel Christopher Gist, 1751
Colonel George Croghan, 1765
Captain Harry Gordon, 1766
Benjamin Franklin, 1768
George Louis LeClerc, Comte de Buffon
General William Henry Harrison, 1795
President Thomas Jefferson, 1797
Doctor William Goforth, 1804
Thomas Ashe, Esquire, 1806
General William Clark, 1807
and John Clifford, 1816
who because of their interest in, collection of and philosophical writings on the

PLEISTOCENE MAMMALIAN FOSSILS
OF BIG BONE LICK

may be properly accredited with the placement of the foundation stones of

KENTUCKY PALEONTOLOGY

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An Introduction to Kentucky Paleontology

One lifts with difficulty the drapings of primeval obscurity which envelope the first inquiries into the occurrence of fossils—relics of pre-historic life—in that part of the Ohio valley known as Kentucky. Although the Western Hemisphere; was discovered by Columbus during the closing decade of the fifteenth century, and both England and France were soon vigorously attempting settlement at a number of points on the middle Atlantic seaboard of North America, it was not until well past the middle of the seventeenth century that intelligent white Europeans penetrated into the unbroken and savage infested wilderness that marked this part of the continent.

In the year 1669 that dauntless French explorer and adventurer, Sieur de La Salle, plunged into the great forest south of Lake Erie and was gone from the western outposts of civilization, in what is now the United States, for two long years. Following his return he claimed to have discovered the Ohio River, and this claim was substantiated for him by some of his contemporaries, particularly Joliet. Admitting the not entirely unreasonable nature of this contention, at least so far as certain upper reaches of the Ohio are concerned, there are some who stoutly oppose the idea that La Salle ever penetrated as far south as the Falls of the River—where Louisville now is—though he did bring back to the St. Lawrence settlements certain knowledge of the existence of the great Rapids.

Granting that La Salle did actually reach in person the Falls of the Ohio, to him must be given the credit for having discovered the two finest fossil localities in Kentucky—and these before the third quarter of the seventeenth century had yet passed. In dropping down the Ohio he would certainly have been taken the short distance up the waters of Big Bone Creek to the Lick to secure food and salt for the saline springs there were widely known to both forest man and beast—the bison, the deer, the elk and other lesser animals finding their way to this place from unbelievably remote ranges. In the alluviated quagmire surrounding these famous Ordovician salt seepages, La Salle must have seen, and with what interest, a great profusion of bones and fragmentary skeletal parts, some at the surface bleached white by many years exposure to the weather, and others partly protruding from the salty sands and muds of the creek bottom. All in all it was the finest and most extensive assortment of Pleistocene and semi-Recent mammalian fossils in this country. Later, and but a few miles further down the Ohio, at the Falls as he traversed the whitened and flood scoured Silurian and Devonian limestones at and adjoining the Rapids, he stood upon what was later to become recognized as one of the greatest and most celebrated Paleozoic coral reefs in this part of the world.

But if he saw then, the wasting bones of the *Mastodon,* the *Mammoth* and the *Megalonyx* at Big Bone Lick, and the coraline petrefactions of *Zaphrentis prolifica* and *Favosites hemisphericus* at the Falls, there is nothing to show that they made any impression upon him for he returned without either the slenderest report or collection to substantiate their existence. A grand soldier of fortune, this technical oversight on the part of La Salle, granting that he saw these very unusual localities, must not be addressed too seriously in his discredit, for at that time neither of the sciences of geology or paleontology had yet been born, and such occurrences when considered at all were quickly passed over as the *prima facie* evidences of the catastrophic and convulsive activities of nature associated with the very general belief in deluvial phenomina.

Be that as it may, no area so surely to be visited by an able bodied traveller at the time, as was this great salt spring, could long remain un-described in the literature of the civilized world. So we find that seventy years after the return of La Salle and long after his death, M. de Longueil, an indefatigable French traveller and explorer accompanied by a number of Indians came and camped there in 1739. In his picturesque account he tells of the great number of bones of gigantic animals found scattered about the great salt spring. If not the first, it is certainly one of the earliest written reports of this unique fossil locality. The period was one of quickening interest in the West. That many another white European traversing the wilderness found his way gratefully to this seepage so much admired by the French coureur de bois, the English Indian traders and the aborigines themselves for its plentiful salt and game, rather than its truly remarkable prehistoric remains, must not be doubted. Years passed and in 1751 when Colonel Chrisopher Gist, early western explorer and Indian scout, visited it and made some small collections of proboscidian teeth, it was apparently well known by all who were passing through this part of the Ohio Valley.

In the year 1765 Colonel George Croghan, who had his Colonial base at Fort Pitt, came purposefully to Big Bone Lick and made what must be considered for the time, rather extensive collections some of which were sent to the American seaboard while others were dispatched to England and to France. During the following year Captain Harry Gordon visited and collected fossil bones and teeth at Big Bone Lick and within a year or two the many sided Benjamin Franklin, and Comte de Buffon, the great French naturalist, were both in possession of and describing these unique fossils in Paris. Interest in the great vertebrate fossils of "the West" then became the thing among those who had the time, the money and the impulse to carry forward such investigations. Rudimentary paleontology had taken possession of the public mind. Hundreds certainly, possibly thousands of first class Pleistocene fossil specimens were taken during the next few years from this wonderful locality.

As indicative of the broad and highly intelligent interest which addressed itself to the collection and description of the remains of the large extinct mammals recovered from Big Bone Lick one has only to refer to the very considerable activity of General William Henry Harrison in 1795, President Thomas Jefferson in 1797, Doctor Goforth of Cincinnati in 1804, Thomas Ashe, Esquire of England in 1806, General William Clark in 1807 and John D. Clifford of Lexington in 1816. Throughout the early and middle part of the nineteenth century not less than fifty or sixty papers, and pamphlets were written and published on Big Bone Lick and its truly magnificent assortment of fossil remains. The subject is yet a live one and of very broad interest as may be deduced from the steady increase of writings on the subject. New papers touching some previously unobserved angle are even at this time of frequent appearance. Not the least of these are those with a decidedly paleontological trend, though no new species have been found or referenced to this locality for many years. Literally tons of fossil bones have been taken, first and last from the saline oozes and muds, now largely solidified, of Big Bone Lick. While it is a fact that much of this once splendid material has been lost or allowed to disintegrate beyond repair, it is nevertheless true that many good specimens are today to be seen in a number of the great national museums of England and France as well as America. Unfortunately but a small amount of the material taken from this once overflowing paleontological storehouse, remains today in Kentucky. Furthermore, in spite of all that has been done in the field of descriptive writing and research there is no complete locating checklist of all known specimens taken from this great Kentucky Lick.

Less spectacular than their vertebrate affiliate, the fields of invertebrate paleontology and paleobotany in Kentucky failed to find commanding and wide interest until the middle or latter part of the first quarter of the nineteenth century. This is the indisputable fact, though these branches are now generally recognized as much more important to geology and mineralogy than is vertebrate paleontology. But the reason for the delay is not far to find. Invertebrate investigations are time-consuming and tedious. They require for both systematic and practical results a very specialized training and experience. During the earliest part of the last century an official or State geological survey had not yet come into existence and individuals found it, without some such means of continued support, impossible to carry forward extensive investigations in widely separate areas. Furthermore there were in fact, no really trained geologists or paleontologists in this Commonwealth. The field of invertebrate fossil inquiry was not, however, empty, much less overlooked. From the earliest times men in the "learned professions" were attracted to it. This was the case in this part of the middle west as well as in those States bordering the Atlantic and in parts of England, France, Germany and elsewhere. In Kentucky we find the earliest references made to invertebrate fossils are by men trained for the law or medicine or who were in the fortunate command of leisure.

In North America the beginnings of geological and paleontological investigation and writing are firmly rooted in the so-called "Maclurean Era" from 1785 to about 1820. The period is named for that very outstanding natural philosopher, William Maclure, who as the result of extended tours afoot throughout the Eastern United States published his "Observations on the Geology of the United States" with a tri-colored areal geological map in 1809. It is the corner stone of American geology. Interest in this volume among cultivated people with a certain personal independence and flair for nature observations was immediate. John D. Clifford of Philadelphia and Lexington, Kentucky, and his friend the eccentric Professor C. S. Rafinisque of Transylvania University began their observations in Kentucky toward the end of this period. Clifford's first article on the geology of this western country bears the imprint date of 1819.

During the two following decades the first serious work on the invertebrates of Kentucky was undertaken, though it must not be overlooked that Samuel L. Mitchell exhibited on plate three of his, "Observations on the Geology of North America" an "asterite or petrified echinus from Kentucky, said to be frequent in the Great Cavern, near the Green River." This book was published in New York in 1818 and the little fossil so early reproduced from this State was undoubtedly *Pentremites conoidens* a small blastid ranging in this area from the Warsaw to the Ste. Genevieve in the Mississippian, or Lower Carboniferous. Among the earliest investigators to mark their labors by publications was John Lewis of Frankfort who may in truth be said to have been the father of the first geological reconnaissance in Kentucky. This investigation was carried forward as an official engagement by William Williams Mather in 1838 and was published in 1839. Subsequently, both separately and collectively papers appeared under the names of David Dale Owen, Joseph Granville Norwood, Lunsford P. Yandell and Benjamin F. Shumard. Samuel Brown, a professor of chemistry at Transylvania University, was also a leader at this time in the field of geologic research and writing as numerous articles attest. Another outstanding scientific figure of this period was John Lawrence Smith who spent much of his life in Louisville and Kentucky. With the exception of Mather and Lewis, all of these early students of geology and invertebrate paleontology in Kentucky were graduate doctors of medicine. Some of them were active practitioners who found these geological trips afield a genuine pleasure.

Such desultory and sporadic work, however interesting, could not be, even in the aggregate, of more than ordinary importance. Kentucky during the first half of the eighteenth century did little more than stand still in the field of geologic and paleontologic investigation. Though systematic work was progressing in States to the north, the East and the Southeast, the Bluegrass Commonwealth simply marked time until Governor Lazarus W. Powell in 1854 approved a bill organizing the "First" Kentucky Geological Survey and subsequently appointed David Dale Owen as State Geologist. Work in the field of paleontology, particularly the invertebrate and paleobotanical fields then went forward with vigor and system. Besides the name of Owen we soon see that of Leo Lesquereux, Nathaniel Southgate Shaler, J. A. Allen, A. R. Crandall, W. M. Linney, William J. Davis, Henry Nettleroth, John M. Nickles, A. F. Foerste, W. C. Morse, A. M. Miller, Charles Butts, E. O. Ulrich, M. R. Campbell, Stuart Weller, J. M. Weller, A. H. Sutton, E. R. Berry, J. K. Roberts, W. H. Bucher, T. E. Savage, A. C. McFarlan and C. L. Cooper as the gamut of published literature relative to the paleontology of Kentucky is unfolded. Close to the turn of the first century of active geologic work in Kentucky begun in 1838 so auspiciously, the year 1931 now drawing to a close witnesses a rather fulsome coverage of the State's paleontology, though numerous local and some regional problems of significance still remain to be solved. Aside from stratigraphy, wherein a number of notable advances have been made within the last decade in many parts of the Commonwealth, the greatest contribution to invertebrate paleontology in Kentucky has been made within the last few years in the Eastern coal field. This research is of real significance because it is the first contribution to our knowledge in a definite way of the invertebrate forms found in the Pottsville rocks of Eastern Kentucky.

In closing these all too brief remarks relative to the sequence and character of paleontologic activity in Kentucky, it is felt that much has been omitted that might have given better insight and deeper interest in this branch of geologic science. The rather widely ramifying literature on the subject, however, is available to everyone and this coupled with short jaunts into the field to special localities where good collecting is possible should afford an intriguing combination to anyone whose time and interest naturally finds profit in this direction. The writer and his collaborators, each in his separate field, have attempted to so design this volume that it will fulfill the requirements of both the amateur and professional geologist working in Kentucky. It is realized that in the same degree that this becomes an actuality, this book will attain value and importance in the literature pertaining to the geology of Kentucky.

Old State Capitol
Frankfort, Kentucky
September 1, 1931.

Director, Kentucky Geological Survey.